



The Effectiveness of an Enrichment Program Based on (ELSA Speak) Application in Developing English Pronunciation Skills Among Third-Level Students at Technical Colleges

Mashael Mohammed Ali Alatni

Department of Curriculum and Instruction, College of Education, Qassim University,
KSA

Dr. Latifah Abdullah Khaled Alharbi

Associate Professor of Curriculum and Instruction, Qassim University, KSA

ABSTRACT

This study investigates the effectiveness of using an enrichment program based on the ELSA Speak application in developing the English pronunciation skills of third-level students at the Technical College in Al Badayea, Saudi Arabia. The objective is to examine how Artificial Intelligence (AI)-supported learning affects students' ability to improve their articulation compared with traditional instructional methods. A quasi-experimental design was employed, involving a sample of 60 students randomly assigned to two equal groups. The experimental group ($n = 30$) received instruction via a specially designed enrichment program integrated with the ELSA Speak application for eight weeks, while the control group ($n = 30$) was taught using traditional methods. Data were collected using a pre-test and post-test administered via the ELSA Speak Assessment tool to ensure objective, standardized measurement of pronunciation proficiency. The results demonstrated that the enrichment program plays a significant role in enhancing pronunciation skills. Statistical analysis revealed statistically significant differences ($p < 0.01$) in the post-test scores in favor of the experimental group, who significantly outperformed the control group. Furthermore, the study found a large effect size ($\eta^2 = 0.62$), indicating that the immediate feedback, autonomous practice, and interactive nature of the application were highly effective in addressing phonological difficulties. The study concluded with a set of recommendations, including the need to integrate AI-based applications such as ELSA Speak into the English language curriculum at Technical Colleges, adopting blended learning models that combine digital practice with classroom interaction, and providing professional training for instructors to manage AI-enhanced learning environments.

Keywords: Enrichment Program; ELSA Speak Application; English Pronunciation; Technical Colleges; AI.



1. Introduction

Roa (2019) highlighted the significance of speaking skills in English language classrooms, emphasizing their essential role in enabling learners to communicate effectively for various purposes. Proficiency in speaking is crucial for English language learners, as strong communication skills — especially in speaking — enhance their opportunities for success in the global labor market, where many employment opportunities depend mostly on strong communication skills. Furthermore, speaking skills are essential for professionals seeking career advancement and for employees aiming to promote their organizations. Speaking is the core of communication, and pronunciation is the most important component of speaking.

Clear pronunciation plays a crucial role in effective communication. Therefore, English pronunciation, including understanding the English phonological system, is essential for students who are learning English as a foreign or second language. Dandee and Pornwiriyaakit (2022) emphasized that pronunciation is vital for both speaking and listening in communication; speakers need to articulate clearly and correctly, and listeners must be able to analyze the speech they hear according to phonemes and phonological systems to interpret it. Pronunciation in the English language is an essential skill that plays a significant role in developing speaking and listening abilities; by practicing pronunciation, students learn to pronounce a word correctly (Cakmak, 2019).

Saudi Arabia has shown great interest in English language teaching due to the importance of English across fields such as education, business, and the economy. English is a core subject at all levels of schooling and is taught as the country's main foreign language. To enhance English language instruction, the government has implemented various policies and initiatives, including collaboration between the government and the private education sector (Alqahtani, 2019). This is also applicable to technical education. Technical colleges in Saudi Arabia aim to provide technical education and training that meet the needs of the labor market and contribute to the development of the national economy at a high level (Saudi Vision 2030). They offer many programs, such as information technology, graphic design, engineering, and accounting. Moreover, to prepare students for the labor market, technical colleges offer three essential English-language courses.

According to Rismawati et al. (2022), the use of technology has become an important part of the learning process inside and outside the classroom. Technology has been used to both support and enhance language learning, allowing teachers to adapt classroom activities by improving the language learning process. Nowadays, the impact of mobile learning applications on learners is generally positive. These applications have been shown to enhance learners' performance and attitudes toward learning, offering flexibility that allows learners to practice anytime, anywhere. Studies have shown that learners who receive feedback through mobile applications experience increased self-confidence in speaking. However, there is limited research on the role of mobile-assisted language learning (MALL) in developing communication skills such as listening and speaking (Shamsi et al., 2019).



English Learning Speech Assistant (ELSA Speak) is a valuable tool for learning English, particularly for improving pronunciation, which is an important factor in mastering speaking skills. ELSA Speak can help users practice and hone their English speaking skills by correcting pronunciation and providing guidance on correct pronunciation, anytime and anywhere. Regular practice with ELSA Speak can help develop English-language speaking skills (Akhmad & Munawir, 2022). As a result of the above, the researcher felt the need for a study to employ technology — especially mobile-assisted language learning (MALL) — in the field of teaching pronunciation, which led to the current study.

1.1 Statement of the Problem

Various studies have emphasized the importance of effective pronunciation in second language learning. Good and correct pronunciation fosters self-confidence and may lead to a better career or, at least, more respect in the workplace (Kobilova, 2022). However, many English language learners encounter difficulties achieving accurate pronunciation due to factors such as language interference, limited exposure to native speakers, and inadequate instruction (Kondo-Brown, 2001).

Since the researcher is an English language teacher at Badayea Technical College, and according to her six years of teaching experience, she has noticed the need to enhance students' pronunciation skills, in spite of the challenges of limited hours of the English course and the difficulty of achieving proper and extensive practice for English pronunciation in large classes. The idea of using the ELSA Speak application was suggested by the researcher, who conducted a pilot study with the application on four of her students to ensure that ELSA Speak was effective, and noticed that the application has a positive effect since it helps students practice pronunciation repeatedly until they are able to pronounce the sounds correctly. Despite the potential benefits of using the ELSA Speak application, the researcher believes it is necessary to investigate its effectiveness as an enrichment program for developing students' pronunciation.

1.2 Research Questions

This study attempts to answer the following questions:

1. What is the enrichment program based on (ELSA Speak) application to develop the pronunciation of third-level students at Technical Colleges?
2. What is the effectiveness of using an enrichment program based on (ELSA Speak) application in developing the pronunciation of third-level students at Technical Colleges?

1.3 Study Hypothesis

Based on the research questions and the study design, the following hypothesis was formulated:

There are statistically significant differences at 0.05 between the mean scores of the experimental group's pronunciation achievement in the post-test and the scores of the control group's pronunciation achievement in the post-test in favor of the experimental group.



1.4 Purpose of the Study

The main purpose of this study is to enhance students' English pronunciation proficiency in the technical education sector. Specifically, the study aims to:

3. Design an enrichment program based on the ELSA Speak application, tailored to the specific needs of third-level students at Technical Colleges.
4. Investigate the effectiveness of using this enrichment program in developing students' English pronunciation skills (specifically articulation, intonation, and fluency).

1.5 Significance of the Study

The significance of the study can be summarized in the following points:

- The results may benefit English language teachers who attempt to treat their students' deficiencies by building an enrichment program based on their students' needs.
- The results may benefit teachers in keeping up with technological developments and incorporating them into the education process to meet students' needs.
- The results may open the path for other studies to implement the ELSA Speak application in different speaking sub-skills.
- The results may benefit officials and curriculum designers in the Ministry of Education to create lessons and activities using modern technology and artificial intelligence to enhance students' pronunciation.
- The results may benefit teachers in encouraging students to practice English pronunciation and dealing with the problem of pronunciation practice in large classes.

1.6 Delimitations of the Study

The study investigated the effectiveness of using an enrichment program based on the ELSA Speak application in developing the pronunciation of third-level students at Technical Colleges. It was conducted in the first semester of the 2025–2026 academic year in the governorate of Badayea, Saudi Arabia, and was limited to level-three female students at the Technical College.

1.7 Operational Definitions of Terms

ELSA Speak application: English Language Speech Assistant (ELSA) is an entertaining and engaging app specifically designed to help users improve their English pronunciation. ELSA's artificial intelligence technology was developed using voice data of people speaking English with various accents, which allows ELSA to recognize the speech patterns of non-native speakers, setting it apart from most other voice recognition technologies (ELSA Co.). The researcher defines the ELSA Speak application operationally as an application that can be used to develop students' pronunciation, by recording their voices and analyzing their pronunciation; it gives the learner a report on each sound they pronounced and the percentage of success, and introduces a set of proposed lessons based on the analysis report.

Enrichment program: The enrichment program is purposefully designed to create a learning environment that enhances various kinds of experiences (Renzulli & Reis, 2008). The researcher defines the enrichment program operationally as a program developed by the researcher that is in addition to the curriculum, whose main aim is to enhance students' pronunciation. The program is structured precisely and consists of



an enrichment plan that includes eight sessions and their goals; each session focuses on a sound for the students to practice and develop, and the researcher chose the sounds included in the sessions after reviewing the most common pronunciation mistakes among Arab EFL learners and according to her teaching experience at Badayea Technical College.

2. Literature Review

There are many studies about "ELSA Speak" as well as studies about "Pronunciation." Therefore, the current study outlines a selection of these studies regarding purpose, methods, samples, instruments, and results, divided into two sections: studies that dealt with the (ELSA Speak) application, and pronunciation studies.

2.1 Studies that Dealt with the (ELSA Speak) Application

Adawiah and Samtidar (2024) conducted a study to examine the effect of the ELSA Speak application on the development of English pronunciation among eighth-grade students at a public junior high school in South Sulawesi, Indonesia. The study employed a pre-experimental research design and involved a sample of 35 students. A 20-word pronunciation test was administered before and after the treatment to collect data. The outcomes revealed a significant increase in the mean score of students, from 77.20 on the pre-test to 83.49 on the post-test. The study recommended that English teachers incorporate ELSA Speak into their pronunciation instruction to enhance students' speaking skills and confidence.

Karim et al. (2023) aimed to examine the speaking performance of EFL students using the ELSA Speak application, explore their perceptions, and identify inhibiting factors. A mixed-methods research design was employed with 21 EFL students using a test, a questionnaire, and a semi-structured interview. The findings revealed a great improvement in students' speaking ability, with the mean rising from 75 (pre-test) to 88 (post-test). Of the 20 respondents, 16 (80%) had positive perceptions of ELSA's potential to enhance their speaking performance, and 95% perceived ELSA as a great application that could motivate them to improve.

Al-Shallakh (2023) investigated the effect of the ELSA Speak application on EFL learners' pronunciation skills in Oman. A sample of 100 college students was divided into a control group and an experimental group. The experimental group used the ELSA Speak app for 8 weeks and received automatic feedback, while the control group received regular classroom instruction. The findings revealed a significant difference in mean scores: the experimental group's mean rose from 73 to 86, while the control group's mean rose from 77 to 81. Interviews indicated that ELSA Speak provided more opportunities for independent practice and reduced anxiety.

Ngoc and Thanh (2023) investigated the benefits and challenges that non-specialized students encounter when using the ELSA Speak application to learn English pronunciation. Semi-structured interviews were conducted with 10 students enrolled in the High-quality English program at a university in Can Tho, Vietnam. Students appreciated the varied exercises, the clear instructions, and the immediate feedback on errors, but they also encountered challenges, including repetitive exercises, missing instructions for certain exercises, and difficulties with voice recognition.



Simanjuntak et al. (2023) aimed to diagnose students' errors in English pronunciation using the ELSA Speak application. The study employed a descriptive qualitative methodology with 15 third-year English department students at Universitas HKBP Nommensen Medan in Indonesia. The results indicated that students' average pronunciation ability fell into the "almost correct" category, with a mean score of 58.02 out of 100, and overgeneralization was the dominant error type. The study recommended incorporating repetitive practice using applications like ELSA Speak to provide instant feedback and scoring.

Cisneros (2023) evaluated the effectiveness of self-learning activities using the ELSA Speak app among second-semester English major students at Universidad Tecnica del Norte University. A mixed approach with 30 undergraduate students was used. The experimental group scored substantially higher on the post-test, indicating an improvement in pronunciation. Student interviews further revealed that the app provided more opportunities for independent practice and reduced anxiety.

Rismawati et al. (2022) investigated the effectiveness of the ELSA Speaking application in improving the English pronunciation of junior-high-school students. A quasi-experimental design was employed with two groups of 30 students each. Independent samples t-test results showed that the post-test mean score of the experimental group (84.1) was significantly higher than that of the control group (81.02). The questionnaire revealed positive attitudes towards using the app.

Muamar (2022) aimed to improve the pronunciation skills of eleventh-grade students at SMAN 9 Makassar School in Indonesia by using the ELSA application. A pre-experimental research design was employed with 36 students. The findings showed a significant increase in the average score, from 51.94 on the pre-test to 63.47 on the post-test, representing a 22.19% improvement.

Akhmad and Munawir (2022) aimed to determine the improvement of students' supra-segmental pronunciation skills in English using the ELSA Speak application, with 20 students at the University of West Sulawesi in Indonesia. The results revealed a significantly higher mean score on the post-test (65.60) than on the pre-test (52.30), with a p-value of 0.000, indicating that the ELSA Speak app significantly improved students' pronunciation skills.

Kholis (2021) implemented the ELSA Speak application to support students' pronunciation skills in classroom action research with 18 English education students at Nahdlatul Ulama University of Yogyakarta in Indonesia. The results demonstrated a significant improvement in students' pronunciation scores across three cycles, with the average increasing from 60 to 80. Interviews revealed high motivation among students.

2.2 Studies about Developing Pronunciation

Al-hilou (2023) investigated the mispronunciation problems of the English affricate sounds /tʃ/ and /dʒ/ among Iraqi EFL learners in both face-to-face and online learning environments with 100 first-year students from the English departments of Baghdad and Mustansiriyah Universities. The study concluded that the position of the affricate sounds affected their pronunciation and recommended placing greater emphasis on teaching phonetics and phonology.



Naji and Almakrob (2023) investigated the production of British English (BrE) vowels by Yemeni EFL learners at different proficiency levels with 67 Yemeni EFL learners at Amran University. The vowels /e/, /ɒ/, /eə/, /ɔ:/, /ʊ/, and /u:/ were the most inaccurately produced across all proficiency levels; production accuracy was lowest for beginners (52%) and highest for advanced learners (76%).

Šimáčková and Podlipský (2023) tested the efficacy of an online pronunciation course in developing the expressive reading skills of advanced English language learners. 16 learners from Palacky University in the Czech Republic comprised the trained group. The trained group significantly slowed their reading tempo and increased their pitch range post-training, indicating that adult EFL learners can enhance their expressive prosody through online pronunciation training, even without in-person interaction.

Dandee and Pornwiriyaakit (2022) investigated the improvement in EFL students' English pronunciation skills through English phonetic alphabet drills with 35 first-year English major students from Rajamangala University of Technology Tawan-Ok, Thailand. The results indicated that students were able to pronounce English consonants and vowels more accurately after the drills, but nasal sounds in the final position and lateral sounds in initial and medial positions remained problematic.

Syed and Hussein (2022) investigated common pronunciation problems faced by 32 female undergraduate EFL students at Qassim University in Saudi Arabia. The preliminary results revealed that most participants had difficulty distinguishing certain sounds, such as /p/-/b/, /f/-/tʃ/, and vowel sounds. Through regular practice sessions on the online platform, most participants demonstrated improved pronunciation.

Utami and Putra (2022) analyzed the phonological processes and rules involved in the production of English consonant sounds by 33 Balinese EFL students. The study showed that phonological errors occur in two ways: assimilation and deletion. The study identified several common phonological errors in English consonant sounds among Balinese EFL students.

Plailek (2021) investigated the English pronunciation problems faced by EFL students with 208 students at Suan Sunandha Rajabhat University in Thailand. English phonemes in the initial syllable position that posed difficulties included /ð/, /θ/, /dʒ/, /ʒ/, /v/, and /z/, while at the final syllable position the challenging sounds were /ð/, /θ/, /v/, /f/, /s/, and /l/.

Altamimi (2015) evaluated the effectiveness of using minimal pairs as a teaching strategy to improve the pronunciation of five English consonant phonemes — /p/, /ʒ/, /v/, /tʃ/, and /ŋ/ — which are not present in Arabic. Thirteen male students aged 13–15 participated. Results showed significant improvements across all five sounds, with the greatest gains in /p/ and /ŋ/ (over a 69% decrease in difficulty).

2.3 Commentary and Research Gap

The current study aims to investigate the effectiveness of an enrichment program based on the ELSA Speak application in improving the pronunciation of technical-college students. Several previous studies have also examined the impact of the ELSA Speak application on pronunciation skills. Karim et al. (2023) found a remarkable improvement in speaking scores after using the app. Rismawati et al. (2022) found ELSA Speak to be effective in enhancing pronunciation, with the experimental group



scoring higher than the control group. Muamar (2022) and Al-Shallakh (2023) likewise reported development in pronunciation after using ELSA Speak. These studies suggest that ELSA Speak can positively impact pronunciation.

Additionally, Dandee and Pornwiriyaakit (2022) highlighted the need for supplementing phonetic drills with targeted exercises for specific sounds. Naji and Almakrob (2023) demonstrated the impact of proficiency on the difficulty areas of vowels. Syed and Hussein (2022) underscored the effectiveness of online practice combined with active interaction, and Šimáčková and Podlipský (2023) showcased the potential of online pronunciation courses for adult learners. Altamimi (2015) provided evidence for the effectiveness of minimal pairs for specific consonant sounds.

Most studies adopted quasi-experimental designs with pre-tests and post-tests to assess the effectiveness of the intervention. However, most differed from the current study in their focus on general EFL or ESL learners rather than technical-college students. Adawiah and Samtidar (2024) and Cisneros (2023) are particularly relevant, as they implemented ELSA Speak as a supplement to classroom instruction, similar to the enrichment-program model in the current study. The principal gap addressed by the present study is therefore the underrepresentation of Saudi technical-college students in the existing literature on AI-assisted pronunciation training.

3. Theoretical Framework

Enrichment programs in English learning are essential for enhancing language acquisition and mastery among non-native speakers. Such programs aim to provide educational experiences that support standard classroom instruction and meet the diverse learning styles and needs of students. Research shows that interactive and experiential forms of learning can significantly enhance language retention and fluency. The American Council on the Teaching of Foreign Languages (ACTFL, 2015) confirms that engaging in real communication within cultural contexts is key to achieving proficiency. Enrichment programs build confidence in language use by helping learners practice speaking and listening in a low-risk environment (Hossain, 2024). Moreover, the incorporation of technology within such programs, whether through online or mobile applications, has widened the focus of these enrichment programs to a global level (Kim, 2016).

3.1 Enrichment Programs

Enrichment programs are special educational initiatives that enable students to participate in meaningful learning activities beyond the regular curriculum. They allow students to enhance their talents, interests, or abilities by offering opportunities for advanced depth and application of knowledge across many contexts. Such programs greatly contribute to students' academic and personal growth by developing creativity, critical thinking, and problem-solving skills through structured initiatives that extend beyond traditional means of learning (Rochayati & Rochayani, 2024). Enrichment programs draw on educational and psychological theories that address diverse learning abilities and promote development.



3.2 The Theory of Multiple Intelligences in English Language Teaching

In 1983, Howard Gardner introduced the theory of Multiple Intelligences (MI), which has had a significant impact on education by challenging the predominantly held concept of intelligence as a single ability. Gardner proposed that intelligence is a combination of several distinct intelligences — linguistic, logical-mathematical, visual-spatial, bodily-kinesthetic, musical, interpersonal, and intrapersonal — with naturalist, spiritual, and existential intelligences added later (Gardner, 2011). Recognizing these differences helps teachers plan more inclusive and sensitive lessons for different learning styles. Integrating MI theory into ELT programs makes language education more inclusive, engaging, and effective, allowing teachers to value diversity in how students learn (Altan, 2012).

3.3 Self-Determination Theory (SDT)

Self-Determination Theory, developed by Deci and Ryan, focuses on the motivational drives in human behavior. Human motivation is derived from three basic psychological needs: autonomy, competence, and relatedness (Annamalai et al., 2023). For language learners, autonomy means having a sense of control over the learning process; competence pertains to the need to feel effective and capable in language activities, with appropriate levels of challenge and feedback; and relatedness implies the need for belongingness within a supportive language-learning community (Ryan & Deci, 2021). Recent studies have extended the application of SDT to language learning: Roki'ah et al. (2023) confirmed that teachers' autonomy support positively affects learners' motivation and achievement in ESL settings, while Al-Khazaali (2023) showed that relatedness via online platforms boosts engagement and performance.

3.4 Benefits of Enrichment Programs in Developing English Language Skills

The objective of enrichment programs is to facilitate the growth of students' English language knowledge. Their benefits include: improving overall language proficiency through diverse exposure (London, 2022); expanding vocabulary and language use through workshops, debate clubs, and literary discussions (Lena et al., 2023); increasing confidence and public-speaking skills (Novia & Ramayanti, 2023); raising cultural awareness through contextual language learning (Porter & Castillo, 2023); promoting peer collaboration and language practice through social interaction (Ondarra et al., 2020); providing access to specialized resources and expertise (McKeown, 2019; Kim, 2016); and encouraging lifelong learning (Gül & Ayık, 2023). Collectively, these benefits empower students to become proficient and confident users of English.

3.5 Pronunciation: Concept and Importance

Pronunciation constitutes a fundamental component of language learning and communication. It involves the way in which a word is spoken, including the articulation of sounds, intonation, stress, and rhythm. Pronunciation influences not only the clarity of spoken language but also the conveyance of meaning and emotion. Pronunciation is vital in ensuring effective communication, enabling speakers to be clearly understood by listeners and minimizing the risk of miscommunication; even minor variations in pronunciation can alter the meaning of a word entirely, such as the



difference between "ship" and "sheep" (Quam & Creel, 2021). Furthermore, pronunciation is closely associated with social identity and listener perception: speakers who demonstrate clear and accurate pronunciation are often perceived as more competent and proficient (Derwing & Munro, 2015), whereas heavy accents or frequent mispronunciations may lead to negative judgments (Rajagopalan, 2008).

Several factors influence pronunciation, including first-language influence, with sounds of the L1 affecting L2 pronunciation and resulting in foreign-accented speech (Al-Jarf, 2022); age, with younger learners more likely to achieve native-like pronunciation (Fahey, 2019); exposure to the target language (Narayana, 2023); and motivation and attitude (Quinapallo et al., 2024). Improving pronunciation requires a multidimensional approach combining phonetic training (Makhsudova, 2023), listening practice (Chacón, 2022), pronunciation drills and shadowing (Oanh & Tri, 2019), and feedback and correction (Öztürk, 2023).

3.6 Technology Used for Pronunciation Practice

The integration of technology into language learning has dramatically affected the way pronunciation is taught and practiced. With the development and increasing use of current technologies such as speech-recognition software, language-learning applications, and online pronunciation websites, learners now have access to tools that provide real-time feedback, customized practice sessions, and the convenience of learning at their own pace (Oanh & Tri, 2019). AI-based applications such as ELSA Speak provide detailed pronunciation feedback by listening to the user's speech, identifying inaccuracies, and suggesting precise adjustments (Liu, 2021). Computer-assisted pronunciation training (CAPT) systems incorporate speech-recognition technology and elaborate feedback mechanisms, often enriched with visual aids, and have been shown to bring significant improvement in pronunciation skills (Neri et al., 2008).

3.7 Pronunciation Learning Challenges

The learning of pronunciation remains one of the difficult areas of language acquisition. Many syllabuses do not allow sufficient time for pronunciation, often sacrificing it for grammatical structures and vocabulary (Darcy, 2018). Other challenges include the regional variety of English accents (Nasir, 2024), the complex phonetic system of English (Gass et al., 2020), and the limited opportunities for explicit practice and feedback (Gilakjani, 2012). For Arabic speakers, sounds that do not exist in Arabic — such as /p/ — are particularly difficult, and learners often substitute them with similar L1 sounds (e.g., /b/).

3.8 The ELSA Speak Application

ELSA Speak is a mobile application that enables users to practice pronunciation with a set of exercises that are graded automatically. The application was developed for Android (available since November 2015) and Apple iOS (available since March 2016) and is upgraded continuously based on user feedback. It offers three main types of practice: pronunciation, intonation, and conversational skills (ELSA, 2022). ELSA uses artificial intelligence developed from voice data of people speaking English with various accents, which allows it to distinguish foreign speakers' speech rate,



phonological influence, and intonation patterns — features that most standard speech-recognition technologies lack (Becker & Edalatishams, 2019).

ELSA Speak's main features (ELSA, 2022; Nushi & Sadeghi, 2021) include: a Speech Analyzer that provides immediate feedback on pronunciation accuracy by cross-referencing the user's speech with native speakers; custom learning pathways tailored to the user's proficiency level and goals; an initial assessment test that evaluates current English proficiency; daily training lessons designed for consistency; progress tracking with comprehensive reports; interactive games to reinforce vocabulary and pronunciation; an AI-powered feedback system that delivers real-time, phoneme-level corrective feedback; and a vocabulary-building dictionary with definitions and example sentences. Collectively, these features make ELSA Speak particularly suitable as the core medium of a structured pronunciation enrichment program.

4. Methodology

4.1 Research Approach

This study is grounded in a positivist research philosophy, which claims that objectives are real and measurable and that causal relationships can be established through empirical observation and statistical analysis. A quantitative approach was adopted to objectively measure the impact of the independent variable (the enrichment program based on the ELSA Speak application) on the dependent variable (English pronunciation skills). Specifically, a quasi-experimental design was employed; this design provides a solid framework for evaluating instructional interventions in real-world educational settings while maintaining a degree of control over extraneous variables. By administering both pre-tests and post-tests to the experimental and control groups, the approach provided the quantitative data necessary to perform inferential statistical analyses — specifically, independent-samples t-tests — for testing the hypothesis and determining whether statistically significant differences existed between the two groups.

4.2 Variables of the Study

The study variables were categorized into two main types. The independent variable was the instructional method used in the intervention — specifically, the enrichment program based on the ELSA Speak application versus the traditional method. The dependent variable was English pronunciation, which was the overall outcome measured by the total score on the ELSA Speak Assessment Test used in the study, measuring the accuracy of articulating individual letters and sounds (phonemes) in comparison to standard American pronunciation.

4.3 Population and Sample

The study population consisted of third-level students enrolled at the Technical College. From this population, a total sample of 60 students at the Technical College in the governorate of Badayea was selected. The selection process was purposeful in its initial stage, where participants were chosen based on the compatibility of their English-language grades in previous years to ensure a comparable baseline of proficiency. The participants were then randomly assigned into two equal groups: the experimental group ($n = 30$) received the enrichment program based on the ELSA



Speak application, while the control group ($n = 30$) was taught the standard English course content using the conventional instructional method.

To verify the equivalence of the two groups prior to the intervention, an independent-samples t-test was conducted on the pre-test scores, with results presented in Table 1.

Table 1. Pre-test Results for the Two Groups to Ensure Equivalence

Variable	Groups	N	Mean	SD	t-value	p-value	Significance
Pronunciation Performance	Control	30	10.65	2.76	0.257	0.789	Not Significant
	Experimental	30	10.48	2.50			

As illustrated in Table 1, the results indicate no statistically significant difference between the mean scores of the two groups. The control group recorded a mean of 10.65 ($SD = 2.76$), while the experimental group recorded a mean of 10.48 ($SD = 2.50$); the calculated t-value was 0.257 and the p-value was 0.789. Since the p-value is greater than the significance level ($\alpha = 0.05$), the results confirm that the differences between the groups were not statistically significant, indicating that the two groups were equivalent in their pronunciation proficiency at the beginning of the study.

4.4 Research Tools and Materials

To achieve the objectives of the study, the researcher prepared two main tools: the enrichment program and the ELSA Speak Assessment Test.

The Enrichment Program: The researcher designed a specific enrichment program based on the ELSA Speak application to develop the English pronunciation skills of third-level students. The program consists of 8 lessons, where each lesson is dedicated to mastering a specific English sound (phoneme). The target sounds covered are: /ə/, /p/, /v/, /z/, /f/, /dʒ/, /ŋ/, and /ʌ/. The phonemes were chosen based on students' needs and previous studies on pronunciation difficulties among EFL learners. Each lesson defines clear objectives, provides articulatory explanations (e.g., "closing lips tightly" for /p/, "biting the bottom lip" for /v/), uses QR codes that direct students to specific Study Sets within the ELSA Speak application, and provides word lists containing the target sound in various positions. A simple web platform was built by the researcher to collect students' self-training results and track their progress.

The ELSA Speak Assessment Test: To measure participants' pronunciation proficiency before and after the intervention, the study used the standardized Assessment Test integrated within the ELSA Speak application (2025 version). The assessment consists of 40 words designed to cover the selected phonemes; participants read these words aloud, allowing the application to capture and analyze their speech patterns in real time, providing specific details on each phoneme. Unlike traditional testing with raw scores, the ELSA Speak Assessment provides a holistic percentage score (0%–100%) that reflects the degree of proximity between the participant's pronunciation and that of native American English speakers. The application classifies the learner's level based on the achieved percentage (e.g., 80–



89% = "Good", 90–100% = "Excellent"). This automated scoring mechanism ensures high internal validity by eliminating human-rater bias.

4.5 Instructional Treatment

The treatment phase was conducted over the period required to cover the eight lessons. The experimental group used the enrichment program based on the ELSA Speak application as the primary instructional medium, leveraging AI-powered immediate feedback through color-coded visual indicators, targeted Study Sets accessed via QR codes, and autonomous self-evaluation. Students were required to achieve a pronunciation level of at least 97% and to repeat the word until the entire word was displayed in green; they also submitted their practice results to the teacher to track progress. The control group received instruction on the same target sounds using the conventional method employed at the college, involving teacher modeling and choral repetition, with delayed and subjective feedback often given to the whole class rather than individually due to class sizes of up to 45 students. To ensure internal validity, both groups were exposed to the same linguistic content; the sole differentiating factor was the instructional method.

4.6 Data Collection Procedures

Data collection followed a scheduled sequence: (1) administrative approval was obtained from the Research and Studies Department of the Technical and Vocational Training Corporation (TVTC); (2) two intact classes were randomly assigned into experimental and control groups; (3) the ELSA Speak Assessment was administered to both groups as a pre-test, with scores analyzed via independent-samples t-test to confirm equivalence; (4) the experimental group received the eight-lesson enrichment program while the control group received traditional instruction on the same content; (5) the post-test (using the ELSA Speak Assessment) was administered to both groups immediately after the intervention; and (6) all scores generated by the application were recorded for statistical analysis.

4.7 Statistical Analysis

Data were analyzed using SPSS. Descriptive statistics (mean, standard deviation) were used to summarize the data. Inferential statistics included independent-samples t-tests to verify pre-test equivalence and to compare post-test scores between groups, and paired-samples t-tests to compare within-group pre-test and post-test scores. The Eta Squared (η^2) statistic was used to measure the effect size of the independent variable (the enrichment program) on the dependent variable (pronunciation skills), thereby establishing practical significance beyond statistical significance.



5. Results and Discussion

5.1 Question One: The Proposed Enrichment Program

To answer the first question — "What is the enrichment program based on the (ELSA Speak) application to develop the pronunciation of third-level students at Technical Colleges?" — the researcher designed an enrichment program tailored to the needs of third-level students at the Technical College. The program is grounded in the belief that language learning is most effective through interactive practice and the use of AI tools like ELSA Speak. By the end of the program, students are expected to develop their pronunciation skills, use the correct tongue position for each sound, utilize the ELSA Speak application for self-learning and self-evaluation, and speak English with greater confidence. The program consists of 8 instructional lessons covering the phonemes /ə/, /p/, /v/, /z/, /tʃ/, /dʒ/, /ŋ/, and /ʌ/. Each lesson follows a structured approach: sound identification and production, articulatory explanation, technology integration via QR codes that link to specific Study Sets in the ELSA Speak application, and interactive practice with real-time AI feedback.

The design of the current enrichment program aligns with modern trends in Computer-Assisted Language Learning (CALL) and Mobile-Assisted Language Learning (MALL). The reliance on ELSA Speak as the core instructional medium is supported by numerous studies that have validated its utility in educational settings. The use of AI feedback is consistent with Adawiah and Samtidar (2024), who found that incorporating ELSA Speak in teaching methods significantly enhances students' skills and confidence; Karim et al. (2023) reported that 95% of students perceived ELSA as a valuable tool. The emphasis on immediate feedback aligns with Simanjuntak et al. (2023), who recommended incorporating repetitive practice with applications such as ELSA Speak to provide instant feedback and scoring, and with Kholis (2021), who emphasized that automatic speech recognition supports independent improvement. The program's autonomous-learning structure via QR codes is consistent with Cisneros (2023) and Al-Shallakh (2023), whose studies indicated that ELSA Speak provides opportunities for independent practice and significantly reduces anxiety. Finally, the selection of target sounds is supported by Plailek (2021), who identified /v/, /z/, and /dʒ/ as challenging EFL sounds; Altamimi (2015), who highlighted /p/, /v/, /tʃ/, /z/, and /ŋ/ as particularly difficult for Arab learners; and Al-hilou (2023), who confirmed the affricates /tʃ/ and /dʒ/ as frequently mispronounced.

5.2 Question Two: The Effectiveness of the Enrichment Program

To answer the second question — "What is the effectiveness of using an enrichment program based on the (ELSA Speak) application in developing the pronunciation of third-level students at Technical Colleges?" — three analyses were conducted: a between-groups comparison of post-test scores, a within-group pre-test/post-test comparison for the experimental group, and a calculation of the effect size of the program.



5.2.1 Differences Between the Experimental and Control Groups in the Post-test

An independent-samples t-test was conducted to compare the post-test scores of the experimental group (which studied using the ELSA Speak enrichment program) and the control group (which studied using the traditional method).

Table 2. Independent-Samples t-test Results of the Post-test for Experimental and Control Groups

Variable	Groups	N	Mean	SD	t-value	p-value	Significance
Pronunciation Performance	Control	30	11.20	2.76	9.57	< 0.001	Significant
	Experimental	30	17.51	2.33			

The results in Table 2 indicate that there are statistically significant differences at the 0.05 level between the mean scores of the experimental and control groups in the post-test. The experimental group achieved a significantly higher mean score ($M = 17.51$, $SD = 2.33$) compared to the control group ($M = 11.20$, $SD = 2.76$); the calculated t-value was 9.57, which was statistically significant. This result confirms that students who used the enrichment program based on the ELSA Speak application outperformed those taught through the traditional method, and supports the study's hypothesis.

The experimental group's mean of 17.51/20 indicates a level approaching the maximum score, whereas the control group's average of 11.20/20 reflects a moderate level of performance. This superiority can be attributed largely to ELSA Speak's ability to provide instant, phoneme-level feedback; unlike the control group, which received delayed and general corrections from the teacher, the experimental students could instantly see their errors and correct them. This aligns with Adawiah and Samtidar (2024), who attributed similar gains to automatic feedback mechanisms, and with Al-Shallakh (2023), who confirmed that automatic feedback was the primary driver for the experimental group's superior performance. The high scores also reflect the intensive and autonomous practice afforded by the application, which allowed students to repeat words until they achieved a high score, fostering a sense of autonomy — a finding consistent with Cisneros (2023). Furthermore, the control group's relatively lower mean highlights the difficulty of teaching complex English sounds (such as /p/, /v/, /z/) through traditional repetition alone, a difficulty noted by Plailek (2021) for sounds that do not exist in learners' native phonological systems, and one that targeted technology-assisted practice can effectively reduce (Altamimi, 2015).

5.2.2 Differences Between the Pre-test and Post-test Scores of the Experimental Group

A paired-samples t-test was conducted to compare the pre-test and post-test scores of the experimental group.



Table 3. Paired-Samples t-test Results Comparing Pre-test and Post-test Scores of the Experimental Group

Variable	Test	N	Mean	SD	t-value	p-value	Significance
Pronunciation Performance	Pre-test	30	10.48	2.50	14.13	< 0.001	Significant
	Post-test	30	17.51	2.23			

The data in Table 3 demonstrates a statistically significant difference at the 0.05 level between the mean scores of the experimental group in the pre-test and the post-test. The students' performance improved remarkably, with the mean score rising from 10.48 in the pre-test to 17.51 in the post-test (out of a maximum of 20). The calculated t-value was 14.13, which was highly significant ($p < 0.001$). This substantial increase confirms that the enrichment program based on ELSA Speak was highly effective in developing students' pronunciation skills.

The improvement from a mean of approximately 52% to approximately 87.5% indicates that the intervention successfully addressed students' initial weaknesses. This finding is consistent with Muamar (2022), who reported a significant improvement from 51.94 (pre-test) to 63.47 (post-test) after using the app, and with Adawiah and Samtidar (2024), who observed an increase from 77.20 to 83.49. The improvement is also attributable to the autonomous-learning aspect of the enrichment program, which allowed students to practice at their own pace using the QR codes — a finding consistent with Cisneros (2023). Additionally, the improvement likely extended to broader suprasegmental features, mirroring the results of Akhmad and Munawir (2022), who reported improvements in suprasegmental skills (52.30 → 65.60). The low standard deviation in the post-test (2.23), relative to the pre-test (2.50), suggests that the program was effective for most students, bringing lower-performing students closer to higher achievers — a consistency also reported by Rismawati et al. (2022).

5.2.3 The Effect Size of the Enrichment Program

The researcher calculated the effect size using the Eta Squared (η^2) formula based on the results of the independent-samples t-test for the post-test.

Table 4. The Effect Size (η^2) of the Enrichment Program on Developing Pronunciation Skills

Variable	t-value	df	Eta Squared (η^2)	Effect Magnitude
Pronunciation Skills	9.76	58	0.62	Large

Table 4 shows that the calculated value of Eta Squared (η^2) was 0.62. According to statistical conventions (0.01 = small, 0.06 = medium, 0.14 = large), this value indicates a large effect size. This result signifies that approximately 62% of the variance in students' pronunciation performance in the post-test can be attributed to the effectiveness of the enrichment program based on the ELSA Speak application —



confirming that the program had a substantial and practical impact on improving students' skills, beyond statistical significance alone.

The large effect size demonstrates that relying on artificial intelligence for pronunciation training is not just a theoretical advantage but a practical one — proving that the application can replace or significantly augment traditional drilling (Adawiah & Samtidar, 2024). The result echoes the substantial improvements reported by Cisneros (2023), and confirms that the engagement maintained by ELSA Speak (Rismawati et al., 2022) translates directly into measurable linguistic gains. Moreover, the large effect indicates that the program successfully helped students overcome phonological difficulties that typically result in only modest learning gains with traditional methods — a finding supportive of Altamimi (2015), who reported significant decreases in difficulty when using targeted strategies for similar sounds.

6. Conclusion, Limitations, and Recommendations

6.1 Conclusion

The study evaluated the effectiveness of an enrichment program based on the ELSA Speak application in developing the English pronunciation skills of third-level students at the Technical College. The study used a quasi-experimental design comparing an experimental group that used the AI-supported enrichment program and a control group taught via traditional methods. The results provide convincing evidence that the ELSA Speak enrichment program substantially developed English pronunciation of the selected phonemes. Unlike traditional methods, which rely heavily on teacher modeling, the AI-supported approach proved superior in facilitating mastery of challenging sounds. Statistical analysis demonstrated significant differences favoring the experimental group in the post-test ($M = 17.51$ vs. $M = 11.20$; $p < 0.01$), significant within-group gains from pre-test to post-test in the experimental group ($p < 0.001$), and a large effect size ($\eta^2 = 0.62$). These findings are consistent with previous research on ELSA Speak (Adawiah & Samtidar, 2024; Cisneros, 2023; Muamar, 2022) and confirm that AI-based enrichment programs are highly effective in higher-education EFL contexts, particularly in technical colleges, where they create a more immersive and less anxiety-inducing learning environment.

6.2 Limitations

Despite the significant positive findings, this study has several limitations. The sample was restricted to third-level female students at the Technical College in Al Badayea, so the results may not be fully generalizable to students in other educational stages or geographical regions. The intervention extended over the period needed to cover eight instructional lessons; while sufficient to measure immediate improvement in articulation, this may not have been long enough to assess long-term retention or transfer to unstructured speech. The primary instrument relied on reading aloud specific words, which, while valid for measuring phonetic accuracy, does not necessarily guarantee similar accuracy in free, unstructured communication where cognitive load is higher. The study also relied on mobile technology; variables such as internet stability, microphone quality, and digital literacy could influence the AI's interpretation. Finally, the program focused on eight specific phonemes, so the



observed improvement reflects these specific domains rather than global English proficiency.

6.3 Recommendations

Based on the study's findings, the following recommendations are proposed:

- Decision-makers should consider integrating AI applications such as ELSA Speak as a mandatory supplementary component of English-language courses, aligned with curriculum outcomes to provide the autonomous practice that is often missing in crowded classrooms.
- Instructors are encouraged to adopt a blended-learning model: while the application handles the mechanical practice of articulation, classroom time should be dedicated to communicative activities where students apply these sounds in real conversations.
- Institutions should provide professional development for EFL instructors on monitoring student progress through digital tools, shifting teachers' role from being the sole source of correct pronunciation to being facilitators guiding self-correction via AI tools.
- Targeted remedial programs for struggling learners can be designed using specific Study Sets via QR codes to address fossilized pronunciation errors without causing embarrassment in front of peers.
- Future research is recommended to investigate additional phonemes not addressed in this study, other pronunciation sub-skills such as stress and intonation, and the impact of ELSA Speak on anxiety and attitudes among Saudi learners.

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